Session 406

QuickTime and Darwin Streaming Server Overview

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Streaming Server Development

What You'll Learn

- What are the QuickTime Streaming Server (QTSS) and Darwin Streaming Server (DSS)?
- Latest status of QTSS/DSS
- An overview of the server functionality
- A basic understanding of streaming protocols
- Ways to extend the Streaming Server
- Development opportunities
- General future direction of the product

What Are QTSS and DSS?

- Three servers in one:
  - Video on demand
  - Live stream reflecting
  - Simulated live via Playlist Broadcaster feature
- Completely standards based
- Single server can scale to thousands of simultaneous clients
- Relay feature allows “server farm” setup
- Supports UDP and HTTP as the transport

Cont...

What Are QTSS and DSS?

- Open source streaming server solution based on standard RTP/RTSP protocols
  - QTSS is for Mac OS X and Mac OS X Server platforms
  - DSS binaries are available on Linux, Solaris, FreeBSD and Windows NT/2000
  - DSS ported to many other platforms by developers
  - Source code is available in public CVS repository

Status Report

- QTSS 3.0 available now!
  - Download for Mac OS X
  - Included with Mac OS X Server
  - Darwin download (binary and source)

New in Version 3.0

- Skip Protection
- Web-based Administration
- Stronger authentication
- Broadcaster “Announce” support
- Broadcast via reliable transport
- API enhancements

New Features
Skip Protection

- Intelligent Retransmits
- Over-buffering
- Bandwidth detection
- Improved thinning

…Just the beginning

New Features
Web-based Administration

- Implemented as a combination of HTML and perl scripts
- Built-in mini web server
- Extensible
- Secure

New Features
Web-based Administration

Streaming Server Admin: clecroy2.apple.com

Back Forward Stop Refresh Home AutoFill Print Mail

Address: https://clecroy2.apple.com:1220/ Go

Live Home Page | Apple | iTools | Apple Support | Apple Store | Microsoft MacTopia | MSN

QuickTime Streaming Server: clecroy2.apple.com is Running — Stop Server Now

STATUS | SETTINGS | LOGS

General Settings | Logging Settings | Playlists Settings

Favorites | History | Search | Scrapbook | Page Holder

General Settings

Submit

Movies Directory: /Library/QuickTimeStreaming/Movies

Authentication Scheme: Basic / Digest

Streaming on Port 80: Enabled / Disabled

Maximum Number of Connections: 1000

Maximum Throughput: 100 Mbps

Start Server at System Startup: ☐

Administrator's New Password:

Re-enter Administrator's New Password:

Internet zone

New Features
Broadcaster “ANNOUNCE” Support

- Automates Broadcasts and Playlists
- Allows broadcasters to initiate and terminate reflector sessions in the server
- Broadcaster chooses broadcast name
- Authenticated

New Features
Reliable Broadcast

- Allows broadcasting via TCP/IP
- Broadcaster can determine buffer sizes

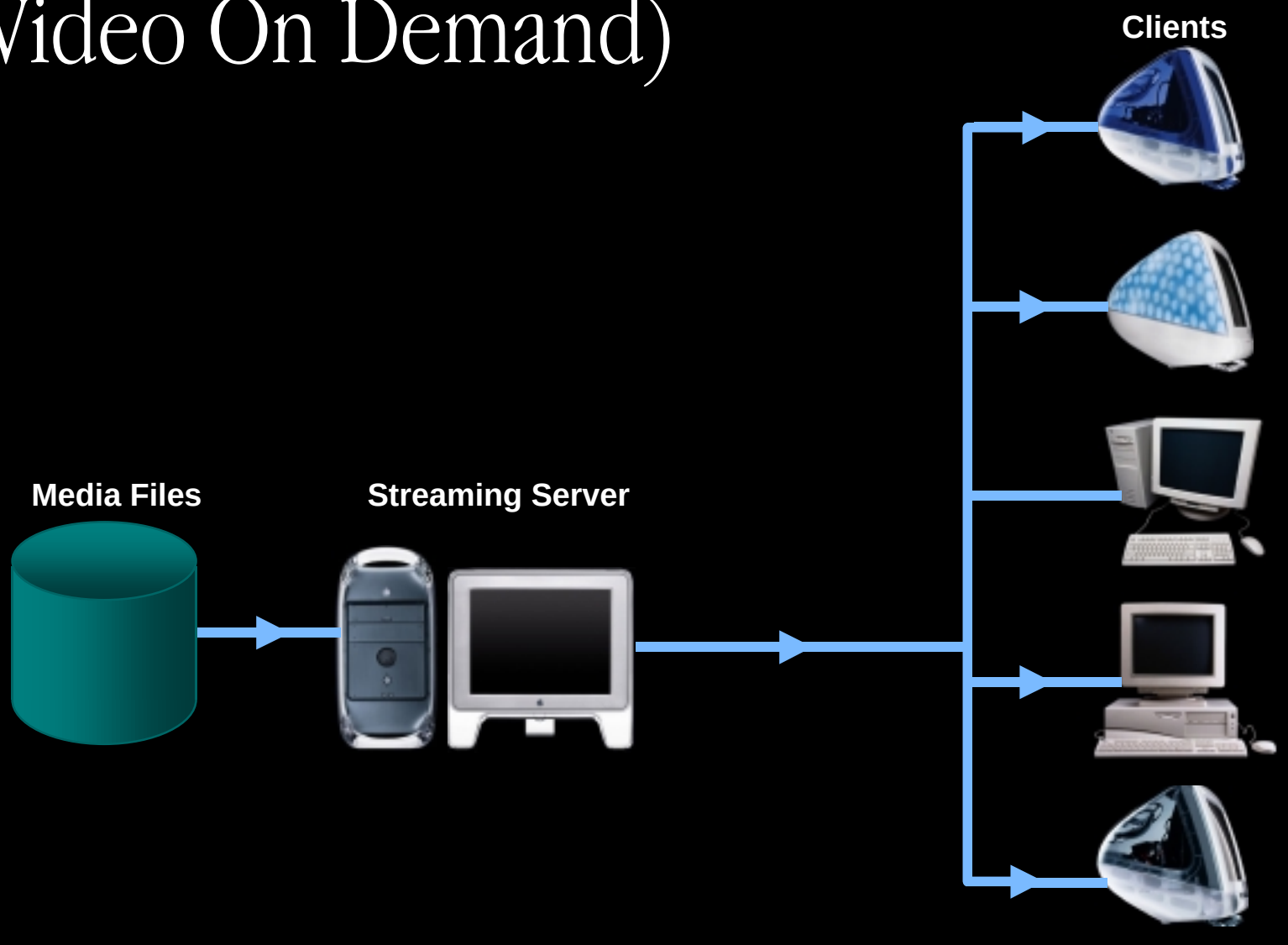
New Features
API Enhancements

- Pluggable file system APIs
- Some minor changes to the authentication roles

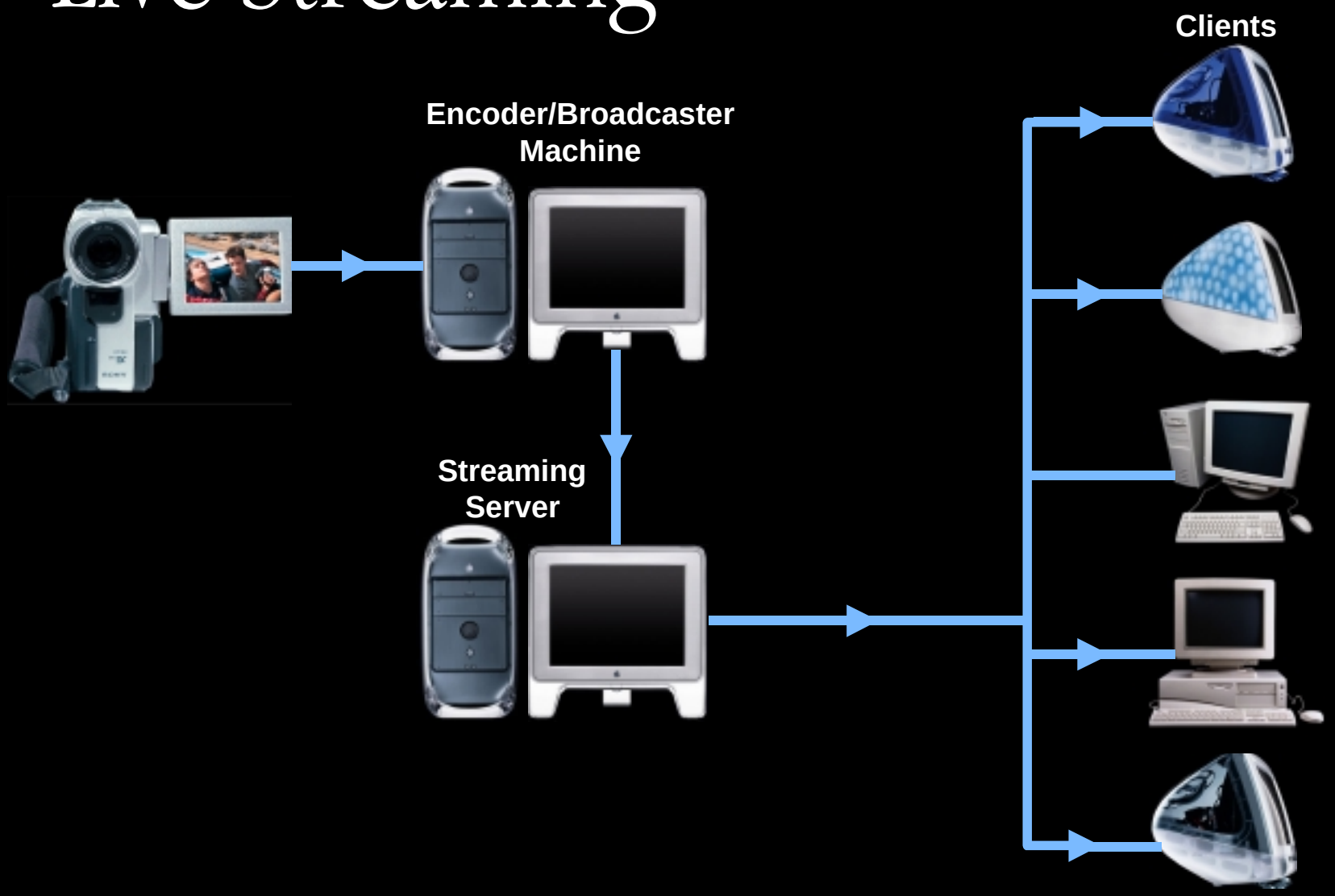
Typical Server Configurations

- Video on Demand
- Live Streaming
- Simulated Live Streaming
- Relay Streaming

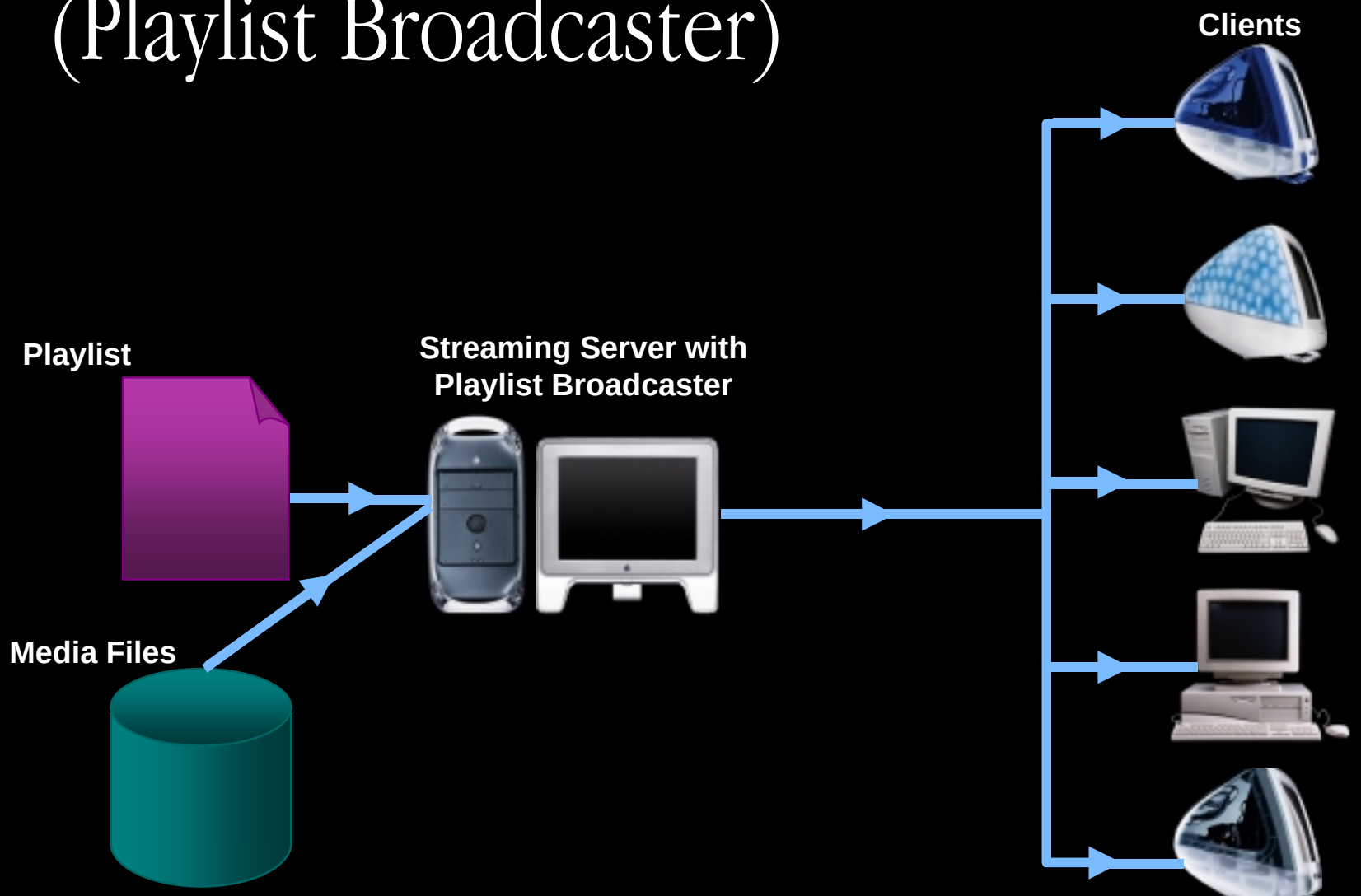
Stored Media Streaming
(Video On Demand)



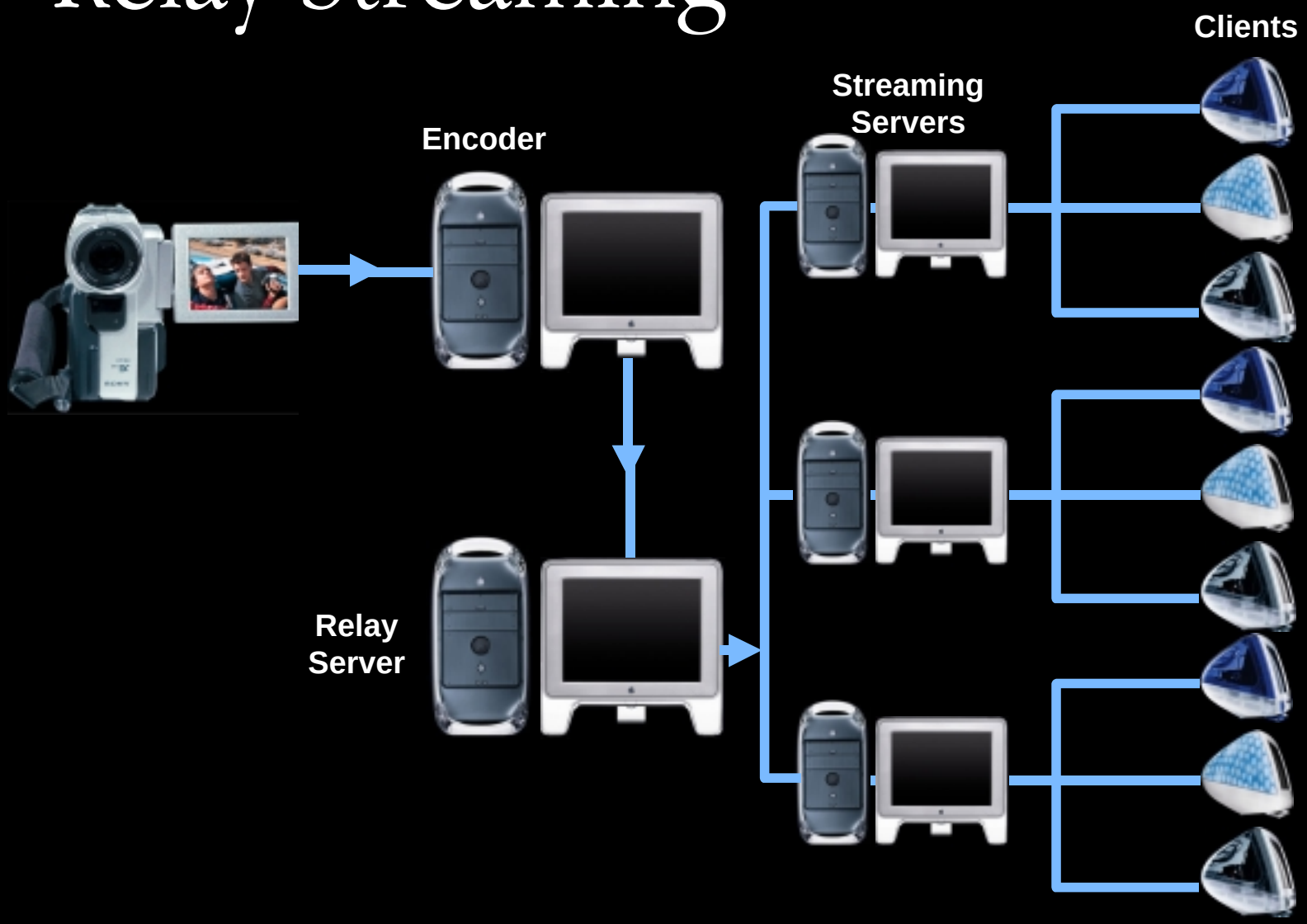
Live Streaming



Simulated Live Streaming
(Playlist Broadcaster)



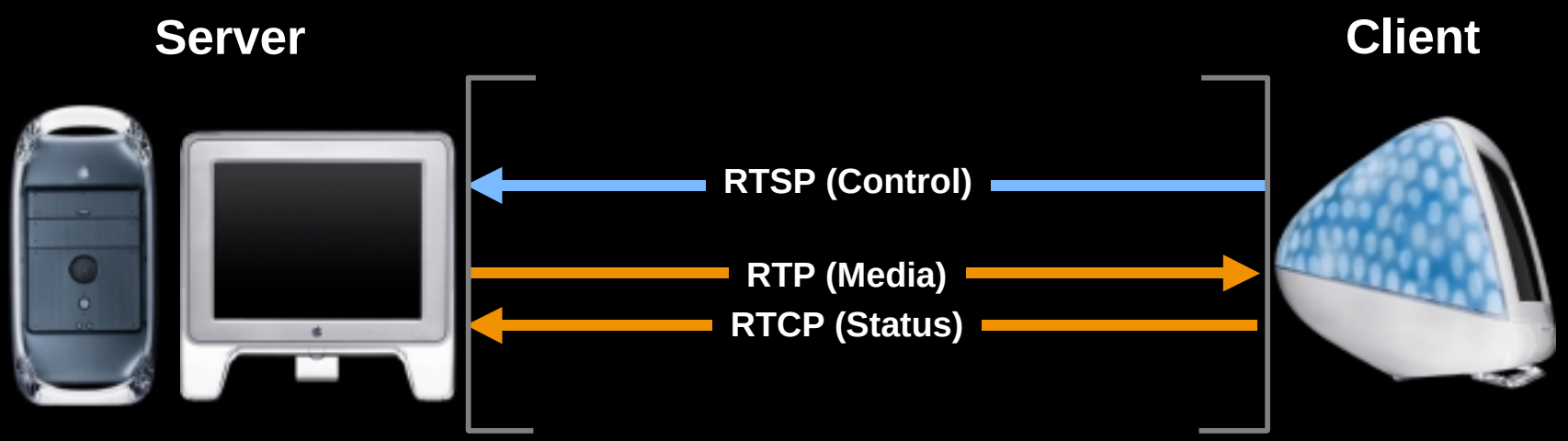
Relay Streaming



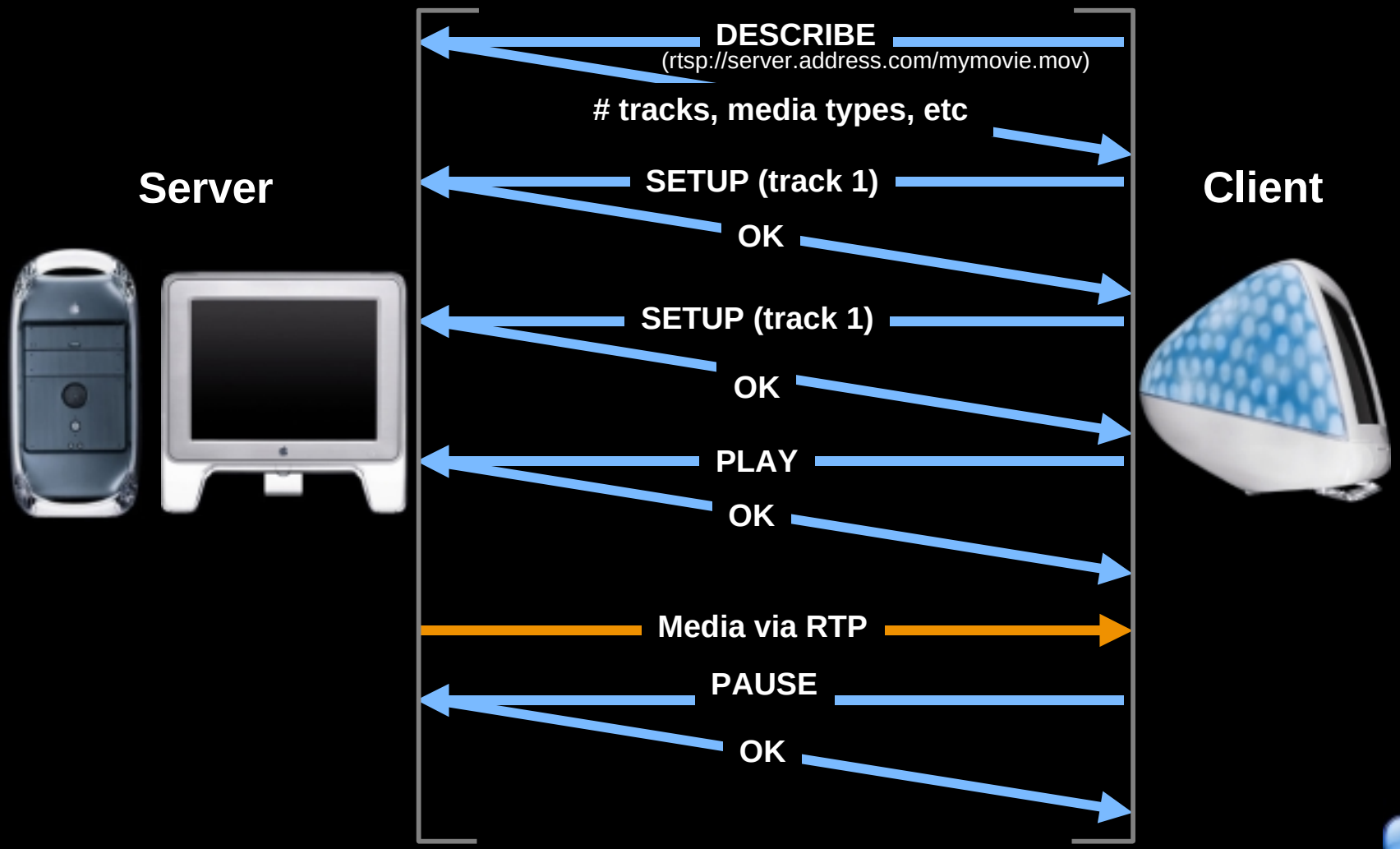
The Protocols

- RTSP (Real-Time Streaming Protocol)
- RTP (Real-Time Transport Protocol)
- RTCP (Real-Time Control Protocol)

The Protocols



Example Session



Extending QTSS/DSS

- Full source code available
  - Source for the server, proxy and admin available

Cont…

Extending QTSS/DSS

- Plug-in API
  - Similar to Apache plug-in API
  - Dynamic modules or compile-in
  - Most server features are implemented as plug-ins
- Admin Protocol/API
  - HTTP-based protocol between the server and external applications
- Customizable Web-based Admin
  - Perl/HTML combination

Development Opportunities

- Port to other OS platforms or use in an appliance
- Plug-Ins
  - Authentication
  - Database integration
  - Logging and reporting
  - Broadcast scheduling
- Monitoring tools via the admin protocol
- Web-based administration extensions

Future Directions

- Continue to support standards
  - Working w/ IETF on protocol extensions
  - MPEG-4 interoperability via ISMA
- Continue to improve quality and performance
- Other leading edge technologies!

Online Resources

- “streaming-server-developers” mailing list
  - http://lists.apple.com
- http://www.opensource.apple.com
- http://developer.apple.com/quicktime
- http://www.ietf.org
  - RTSP: RFC-2326
  - RTP: RFC-1889
  - SDP: RFC-1998

Roadmap

407 Customizing QuickTime & Darwin Streaming Server	Civic **Thurs., 10:30am**
FF109 Feedback Forum: QuickTime	Room J1 **Thurs., 3:30pm**

Who to Contact

Jeff Lowe
QuickTime Technology Manager
Apple Worldwide Developer Relations
jefflowe@apple.com

Q&A

http://developer.apple.com/events/urls.html

ANNOUNCING

QuickTime Live!

October 8–11, 2001

The Beverly Hilton Hotel

Beverly Hills, CA

Full day workshops, Conference Sessions,
QuickTime Product Showcase, Keynotes and Social Events with the community
of QuickTime Developers, Content Creators, and New Media Business Professionals.
Get Face-to-Face with the QuickTime team for a week of training, business
Opportunities and industry perspectives that you can't get anywhere else.

www.apple.com/quicktimelive

Develop. Produce. Deliver.

WWDC
Worldwide Developers Conference 2001